

Amendment and Response to 1st Office Action
U.S. Application Serial No. 10/622,242
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including the limitations of the base claim and any intervening claims.

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 8, 9, 12, 15 and 16 as directed below. Claim 17 has been canceled because its limitations have been incorporated into claim 16. Claims 2-7, 10-11, 13-14, 18 and 19 have not been revised but are reprinted below for the Examiner's convenience. The claims have thus been revised in the manner required by 37 C.F.R. §1.121.

1. (Currently Amended) An injector system for injection of a fluid medium into a patient within an electromagnetic isolation area, the injector system comprising:

(a) a powered injector positioned within the isolation area;

(b) a first communication unit ~~positioned within the isolation unit and associated integral~~ with the powered injector ~~[so that]~~ thereby enabling the first communication unit and the powered injector ~~[can]~~ to be moved as a unit; ~~[and]~~

(c) a system controller positioned outside the isolation area, the system controller comprising an operator interface; and

(d) a second communication unit integral with the system controller, the first and second communication units being adapted to communicate ~~with the second communication unit~~ by transmission of energy through the air, the energy being chosen to not create substantial interference with a magnetic resonance imaging scanner.

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2. (Original) The injector system of Claim 1 wherein the energy is electromagnetic energy outside the frequency range of the scanner.

3. (Original) The injector system of Claim 2 wherein the frequency of the RF energy is above approximately 1 Gigahertz.

4. (Original) The injector system of Claim 1 wherein the energy is sonic energy or ultrasonic energy.

5. (Original) The injector system of Claim 1 wherein the energy is visible light or infrared light.

6. (Original) The injector system of Claim 1, further comprising at least one intermediate communication unit positioned within the isolation area through which the first communication unit can communicate with the second communication unit, the first communication unit communicating with the intermediate communication by transmission of energy through the air.

7. (Original) The injector system of Claim 1, further comprising a plurality of intermediate communication units positioned within the isolation area through which the first communication unit can communicate with the second communication unit, the first communication

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unit communicating with the intermediate communication units by transmission of energy through the air.

8. (Currently Amended) A system for use with an MRI scanner positioned on a first side of an electromagnetic isolation barrier, the system comprising:

an injector control unit operable to control injection of a fluid medium into a patient, the injector control unit positioned on the first side of the isolation barrier and comprising a first communication unit integral therewith; and

a system controller positioned on a second side of the isolation barrier, the system controller comprising a second communication unit integral therewith, the first communication unit being adapted to communicate with the second communication unit in a bi-directional manner by transmission of energy through the air, the energy being chosen to not create substantial interference with a magnetic resonance imaging scanner.

9. (Currently Amended) The injector system of Claim 8 wherein the first communication unit is integral with and the injector control unit ~~are connected so that so that~~ thereby enabling the first communication unit and the injector control unit ~~can~~ to be moved as a unit.

10. (Original) The injector system of Claim 9 wherein the energy comprises electromagnetic energy outside the frequency range of the scanner.

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11. (Original) The injector system of Claim 11 wherein the frequency of the RF energy is above approximately 1 Gigahertz.

12. (Currently Amended) A communication system for use with an MRI imaging system, the communication system comprising:

a first communication unit positioned within a shielded housing on an interior side of the isolation barrier, the first communication unit comprising a first receiver and a first transmitter; and

a second communication unit positioned on an exterior side of the isolation barrier, the second communication unit comprising a second receiver and a second transmitter, the first communication unit being in connection via optical cabling with a first light collimating ~~transmitting~~ device positioned on an interior side of the isolation barrier adjacent a viewing window in the isolation barrier, the second communication unit being in connection via optical cabling with a second light collimating ~~transmitting~~ device positioned on the exterior side of the isolation barrier adjacent a viewing window in the isolation barrier, the first communication unit and the second communication unit communicating via transmission of optical energy between the first light collimating ~~transmitting~~ device and the second light collimating ~~transmitting~~ device.

13. (Original) The communication system of Claim 12 wherein the first communication unit is positioned within a shielded housing.

14. (Original) The communication system of Claim 12 wherein the first communication unit is positioned within a shielded housing of an injector control unit.

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15. (Currently Amended) The communication system of Claim 14 wherein the first light collimating ~~transmitting~~ device includes a first lens assembly in communication with the first transmitter via optical cable and a second lens assembly in communication with the first receiver via optical cable, the second light collimating ~~transmitting~~ device including a third lens assembly in communication with the second receiver via optical cable and a fourth lens assembly in communication with the second transmitter via optical cable, the first lens assembly and the third lens assembly being in general alignment to enable communication between the first transmitter and the second receiver via transmission of light therebetween, the second lens assembly and the fourth lens assembly being in general alignment to enable communication between the first receiver and the second transmitter via transmission of light therebetween.

16. (Currently Amended) A method of controlling an injector within an isolation barrier of a magnetic resonance imaging area, the method comprising:

transmitting RF signals outside the frequency range of the magnetic resonance imaging scanner from a system control unit positioned outside the isolation barrier to an injector control unit inside the isolation barrier, the system control unit comprising an operator interface; and

transmitting RF signals outside the frequency range of the magnetic resonance imaging scanner from the injector control unit to the system control unit;

wherein RF signals of at least two different frequencies are transmitted to authenticate data, with each of the RF frequencies being outside the frequency range of the scanner.

17. (Canceled)

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18. (Original) The method of Claim 16 wherein a predetermined authentication algorithm is used to authenticate RF signals transmitted between the system control unit and the injector control unit.

19. (Original) A method of transmitting data between the exterior of an isolation barrier of a magnetic resonance imaging area and the interior of the isolation barrier, the method comprising:

positioning a first passive light transmitting assembly adjacent a translucent window in the isolation barrier on the outside of the isolation barrier;

positioning a second passive light transmitting assembly adjacent the window on the interior of the isolation barrier in general alignment with the first light transmitting assembly such that light energy can be transmitted therebetween; and

connecting the second light transmitting assembly via optical cable to a communication unit positioned within a shielded housing within the isolation barrier.

REMARKS

Claims 1-16 and 18-19 are pending; and claim 17 has been cancelled as its limitations have been incorporated into claim 16. Claims 1, 8, 9, 12 and 15 have been amended to further highlight their patentability over the prior art of record. Applicants also present arguments below that establish the patentability of the subject matter in the pending claims over the cited prior art.

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Claims 1, 5, 8-9, 12-15 and 19 Stand Rejected Under 35 U.S.C. §102(b)

Claims 1, 5, 8-9, 12-15 and 19 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,494,036 to *Uber et al*, which has since been reissued as U.S. Patent Re37,602.

Claim 1, particularly as amended, is novel over the teachings of the '036 patent. Claim 1 now recites "a first communication unit integral with the powered injector" and "a second communication unit integral with the system controller..." This revision makes explicit the ability of the powered injector and its integral first communication unit to be moveable throughout the isolation area (e.g., scanner room) as a single unit rather than as two or more separate pieces of equipment. Similarly, claim 1 also recites the system controller and its second communication unit as being integrated into a single, moveable unit. Although different in certain other respects, claim 8 is similar in this particular regard.

The '036 patent, however, discloses in both its drawings and its text an external transceiver 22 connected to a system controller 12 via a communications line 20. ('036 patent at Figure 1; col. 2, lines 49-51) It further discloses an internal transceiver 26 connected to injection control unit 30 via a communications link 28. (Id. at Figure 1; col. 3, line 66 - col. 4, line 1) Nowhere in the '036 patent is there disclosed an integrated assembly comprising either an injection control unit and communication unit or a system controller and communication unit. For users of the invention taught in the '036

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patent, any movement of the injection control unit 30 in the scanner room 18 would require at the very least manipulation of the cord (i.e., communications link 20) that connects it to transceiver 26 in such a way as to avoid a tripping hazard. Alternatively, a new (shorter or longer) cord could be substituted and then routed between the two separated devices. Even worse, the movement of injection control unit 30 may require movement of both the cord 20 and transceiver 26. In the respective systems of claims 1 and 8, however, the integration of the first communications unit with an injection control unit 30 (or other device) enables the combined assembly to be moved as a single unit, without the hassles associated with separated components and the cords interconnecting them.

Claim 12 and its dependent claims 13-15 are directed to a "communication system for use with an MRI system" that is novel in several respects over the '036 patent. First, claim 12 recites a "first communication unit ... in communication via optical cabling with a first light collimating device" positioned on the interior side of the isolation barrier. It also recites a "second communication unit ... in communication via optical cabling with a second light collimating device" positioned on the exterior side of the isolation barrier. By this Amendment, the broader term "collimating" has been substituted for "transmitting." In each of the recitations above, claim 12 clearly sets forth communication hardware having three separate physical elements: (1) a communication unit, (2) a light

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collimating device, and (3) the optical cabling interconnected them. The '036 patent, however, does not teach such a three part system.

More specifically, the '036 patent teaches an internal transceiver 26 communicating via a communications link 28 with injection control unit 30, all inside shielded room 18. ('036 patent at Figure 1; col. 3, line 66 - col. 4, line 1) It further teaches an external transceiver 22 communicating via communications line 20 with system controller 12, all outside the shielded room 18. (Id. at Figure 1; col. 2, lines 49-51) Significantly, the communication hardware taught in the '036 patent consists of only a transceiver and a line that connects that transceiver to either an injection control unit or a system controller. In contrast, in each of its two recitations, claims 12-15 recite a communication unit and a light collimating device, separated from each other, and the optical cabling interconnecting them. The communication hardware taught in the '036 patent is thus clearly different from that claimed in claims 12-15. Not only does the '036 patent teach nothing about this particular three element hardware configuration, it also is silent about collimating devices--whether for transmission or reception of light or both. Claims 12-15 of the present application are therefore not anticipated by the '036 patent under 35 U.S.C. §102(b).

Similarly, the '036 patent teaches nothing about the use of passive light transmitting devices of the type recited in claim 19.

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Claim 16 has been amended to include the limitations of claim 17, which the Examiner indicated would make claim 16 allowable. Claim 16, and its sole remaining dependent claim (i.e., claim 18), thus also overcome the pending rejection under 35 U.S.C. §102(b).

Claims 2-3, 10-11 and 16 Stand Rejected Under 35 U.S.C. §103(a)

Claims 2-3, 10-11 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '036 patent in view of U.S. Patent 6,198,285 to *Kormos et al.*

In view of the foregoing amendments and arguments, Applicants believe that the §103(a) rejections of these claims have been overcome.

CONCLUSION

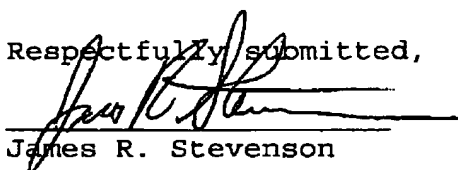
Given the foregoing, Applicants respectfully request withdrawal of the rejections set forth in the Office Action dated 15 July 2006. Applicants believe the application is ready to be allowed. If the Examiner has any questions regarding this Amendment and Response, he is invited to call the undersigned at the telephone number listed below.

This Amendment and Response is accompanied by a **Petition For Extension of Time** for two months. The Commissioner is authorized to

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charge Deposit Account No. 13-2530 for the amount necessary to
process and consider this Amendment and Response.

Respectfully submitted,


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